

Calispell Diversion Canal

1.2 miles southeast of the intersection
of Flowery Trail Road and State Route 20
Usk vicinity
Pend Oreille County
Washington

HAER No. WA-16

HAER
WASH,
26-USK.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTION DATA

Historic American Engineering Record
Western Regional Office
National Park Service
San Francisco, California 94102

HISTORIC AMERICAN ENGINEERING RECORD

HAER
WASH,
26-USK.V,
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Calispell Diversion Canal

HAER No. WA-16

Location: Beginning .5 mile south-southwest of where County Road 9502 crosses Calispell Creek, the 7-mile-long canal meanders in a northeasterly direction along the edge of the Calispell Valley, and terminates in Davis Creek at a point 1.2 miles southeast of the intersection of Flowery Trail Road (County Road 9216) and State Route 20. Usk vicinity, Pend Oreille County, Washington

UTM: Beginning (diversion dam and headgate).. 11.474430.5342640
Flume remains 11.474700.5343350
Rock and concrete lining 11.476130.5344650
Proposed Ponderay Newsprint Company
entrance road site 11.479860.5348450
Proposed Ponderay Newsprint Company
railway/water supply corridor site ... 11.480060.5349510
Ending (outlet weir and spillway) 11.480460.5349490

Date of
Construction: 1933-1936

Engineers: Harold A. Sewell (1933-early 1934); Chleon Carter (early 1934-1936)

Builder: Pend Oreille County, in conjunction with the Civil Works Administration (CWA), the Public Works Administration (PWA), and the Works Progress Administration (WPA).

Present Owner: Multiple private ownership (proposed Ponderay Newsprint Company plant site in SE Sec. 5, NE /Sec. 8, T32N R44E is owned by Lake Superior Forest Product Inc., Agent for Ponderay Newsprint Company, P. O. Box 430, Thunder Bay, Ontario, Canada P7C 4W3).

Present Use: Abandoned (tested only once and never used).

Significance: The building of the Calispell Diversion Canal was one of the largest and most widely publicized New Deal projects undertaken in northeast Washington during the Great Depression. Much of the construction work was done by hand labor and with horse and mule teams, and the facility was designed to be entirely manually operated. The project was abandoned when nearing completion in the mid-1930s and, consequently, the canal has remained virtually intact and unaltered ever since. Its many features

clearly delineate the intended functions of the various parts of the reclamation scheme and, as such, reveal much about the engineering technology of the 1930s and preceding decades. The canal was determined eligible for the National Register of Historic Places in 1985.

Report

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Date: March 1986

Edited, Retyped

and Transmitted by: Jean P. Yearby, HAER, 1988

DESCRIPTION

The abandoned, but largely unaltered, main canal of the Calispell Diversion Project is situated a few miles south of the town of Usk, in Pend Oreille County in the extreme northeastern portion of Washington (see Map 1).

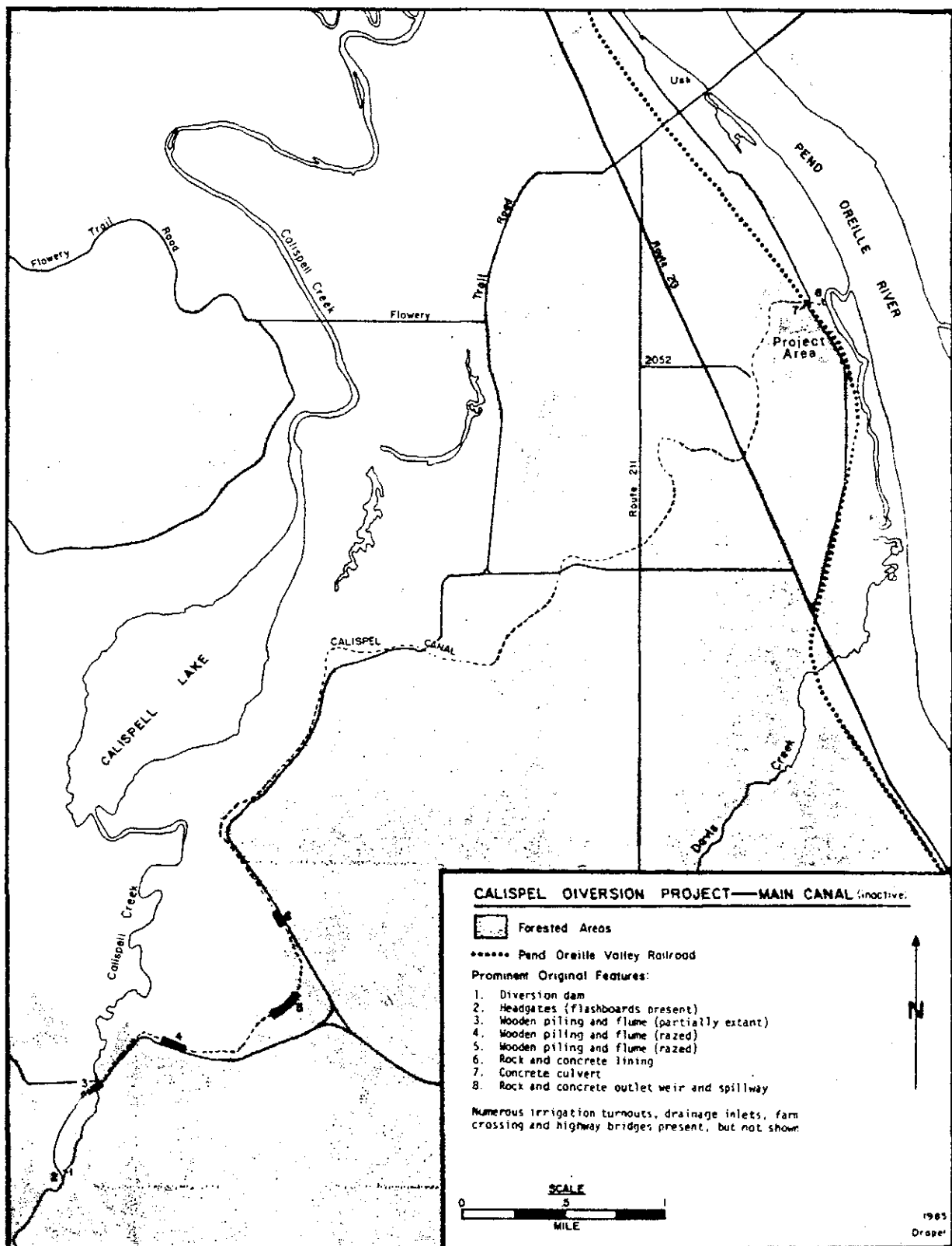
Its intended purpose was to drain and irrigate the meadows and marshlands in the southern part of the Calispell Valley, which is a large, open flat of 30,000 acres dominated by Calispell Lake and its principal northward flowing tributary and effluent Calispell Creek. The valley is slightly over 2,000 feet in elevation and is bordered on the west side by rugged, forested mountains and to the east by the broad Pend Oreille River. Calispell Creek eventually flows into the Pend Oreille River a few miles north of the project area.

The canal was designed to carry part of the flow of Calispell Creek, both during the runoff season to prevent flooding and in the dry season when irrigation would be necessary. The ditch begins at and diverges from Calispell Creek at a point two miles above the lake, and meanders for seven miles along the southern margin of the Calispell Valley. It terminates in Davis Creek, a few hundred feet from the latter stream flows into the Pend Oreille River. The canal drops just slightly less than nine feet in elevation throughout its length.

Construction was undertaken between 1933 and 1936, during the darkest days of the Great Depression. Federal and State agencies provided authorization and most of the funding, but the project itself was designed and directed by county and local officials. Pend Oreille County, of course, was in the deepest throes of the depression, and many men were out of work. As prescribed by law, persons listed on the relief rolls and other unemployed workers qualified for hiring. This meant that it was primarily local residents of the county who were engaged to build the canal. Many of them were farmers and loggers, who brought along horse or mule teams for hire.

Most of the construction work was done by manual labor, and with horse and mule teams. Team drivers led two or three draft animals, which pulled manually-operated fresnos, scrapers (including a small two-wheeled type) and dump wagons to move dirt and gravel. Dump wagons were operated with hand cranks by the team drivers, and at least 20 of these vehicles were authorized for the project in early 1934. The consulting engineers also rented some modern mechanized equipment, such as power shovels, pile drivers, dump trucks, and caterpillar tractors. A typical authorized work force, as of mid-summer 1934, included 97 laborers, 20 carpenters, 17 team drivers, and about 10 supervisors.

The route was surveyed and work started in late 1933. Crews began clearing the route, and a pile driver was put in operation, probably at the location of one of three flumes that were built at the upper end of the canal. Dynamite frequently was used to blast out tree stumps. December 1933, however, was the wettest month on record, with 8.63 inches of precipitation, and rising water stopped



Map 1. The seven-mile-long canal skirts the tree line in the southern part of the Calispel Valley.

construction before the end of the year. This was the first of several temporary and long-term halts and partial shutdowns that plague the project at times. These stoppages were due to adverse weather, lack of funds and materials, administrative changes, or even a shortage of workers on those rare occasions when local sawmills and logging operations were going full tilt.

Later that winter, little snow fell and the weather turned mild, allowing a full complement of men to return to work in early 1934. By April, a large, diesel-electric power shovel also began operating. Construction activity now was in full swing.

The men constructed wooden flumes, as well as rock and concrete spillways and other masonry structures, which were widely distributed throughout the project area. Altogether, the flumes and masonry features comprised about one-half mile of the total length of the canal. The rest of the seven-mile-long channel, of course, consisted of earthen ditches. The contours and dimensions of the various segments of earthen canal were mainly determined by the different kinds of soils and gravel encountered. Some soil or gravel types naturally hold on slopes and withstand water action better than others. Thus, the contours and dimensions of ditches varied, depending on the inherent characteristics of the terrain. Slope gradients of the sidewalls were either 1-1/2:1 or 2:1, canal widths varied within the range of 30 to 40 feet (measured between crests of the sidewalls), and the depths of the channels were between 6 and 8-1/2 feet. Altogether, six different sets of wall and slope configurations were utilized in constructing ditches.

At the west end of the project (see map 1, page 4), a 110-foot-wide dam was built across Calispell Creek at the point where the stream was to be diverted into the canal (see HAER Photograph No. WA-16-1). It was a concrete sill structure, which supported a steel framework designed to hold manually-operated flashboards (wooden planks). To impound the stream, the flashboards were dropped edgewise on top of each other in the vertical grooves of the steel joists, thus closing off the spillway and impounding the stream. The joists also supported a board walkway across the top of the dam.

An adjacent 80-foot-long masonry wall connected the diversion dam to the canal headgate (see HAER Photograph No. WA-16-2), located just upstream on the west side of the creek. The headgate likewise was a masonry structure, 60 feet wide, with steel joists holding removable flashboards and a walkway. The spillway was fully 70 feet long, narrowing down to approximately 20 feet at the junction with the earthen canal. The headgate could take water out of Calispell Creek, up to the depth of four feet above the sill. Flashboards were transferrable by hand between the headgate and the diversion dam; in fact, the entire facility was designed to be operated manually.

The first section of earthen ditch extended northward from the headgate spillway and across a broad terrace located west of the stream. At a distance of one-half mile, the canal again converged with Calispell Creek, but crossed over it from

west to east on a wooden flume approximately 500 feet long (see HAER Photographs No. WA-16-3 and WA-16-4). This flume, as well as two others located in the next mile, was four feet wide at the top and stood on a broad base of timbered pilings and bracings. Some masonry work was done at the east end, where the wooden chute met the next section of earthen ditch.

The second flume, which stood one-half mile farther down, was constructed to avoid the buildings on the Lydia Zigler farmstead (now the Donald and Gail Norton place). Likewise, this flume was about 500 feet long and took several months to build. Farms and ranches were located all along the ditch's route, which unavoidably passed directly through at least six farmyards. In these instances, the canal builders carefully avoided standing structures or undertook other measures to protect farmsteads.

A marsh necessitated the erection of a third flume, situated one-half mile further to the northeast. This flume was longer, being approximately 700 feet in length, and it crossed well above the muddy, water-logged terrain. In this same locality, a power shovel was needed to construct the earthen portions of the canal. In fact, a power shovel was used in any difficult place where horse and mule teams could not operate. In swampy areas, the power shovel moved on a mat of logs laid over the moist, unstable ground.

Wet conditions also were a problem on the Edward "E. J." Zigler property, located another one-half mile north, where the canal ran between the house and barn. The soil was sandy and porous in this locality. Spring water leaking into the ditch flowed down to Zigler's place, where it seeped through the canal's sidewalls and into the farmyard. The house, standing on higher ground, was unaffected, but the barn, situated on the downhill side of the ditch, became surrounded by a nearly impassable quagmire. Workmen returned to this spot and lined the canal with about 250 feet of rock and concrete, which stopped the seepage (see HAER Photograph No. WA-16-5).

At night and on days off, some team drivers left their horses and mules in E. J. Zigler's large board and batten barn, which still stands. As many as six or eight draft animals were kept there. Other horses and mules likewise were sheltered on other nearby farms. When not working, the men returned to their homes throughout the county. The power shovel operators, on the other hand, were from other parts of the State and board in Usk. Thus, there were no workers' camps along the route. It was most convenient for the team drivers to leave their horses and mules at the project site and pay a local farmer to take care of them. E. J. Zigler and other nearby residents also hired out their own horses or mules and likewise worked on the project.

Most carpenters of this period were just as skilled in finishing rock and concrete, as in working with lumber. Their craftsmanship still is evident throughout the project area, despite the fact that they had only the most basic kinds of tools and materials. In addition to constructing the dam, headgate,

lining, and spillways, they also built numerous irrigation turnouts, as well as abutments for farm, county, and State roadways. For example, at typical farm crossings, they constructed pairs of large, wall-like abutments into the canal sidewalls (see HAER Photograph No. WA-16-11). Long, wooden planks then were laid across the tops of the rock and concrete abutments, forming one-lane bridges spanning the canal. Altogether, more than a dozen private and public roads spanned the ditch at various points. County and state roadways crossed on larger bridges.

Each 40-acre parcel of farmland located in the project locality was entitled to a six-inch irrigation turnout. Practically all of the outlets were situated at the base of the canal's western embankment, since it was in that direction that the arable land was located. There were numerous small outlet pipes with baffles, as well as larger, concrete turnouts that supported pairs of vertical steel joists into which flashboards were fitted to form headgates (see Photograph No. WA-16-9). It was intended to divert water as needed into small ditches in the farmers' fields. The level terrain of the Calispell Valley would have been ideal for such a system. Though some easements were recorded, no subsidiary canals were ever constructed.

Much of the last one-half mile of ditch near the Pend Oreille River was dug by a power shovel. A built-up earthen road, on which the power shovel operated, can yet be seen here and, in fact, is part of the western embankment of the canal (see HAER Photograph No. WA-16-10).

A large and impressive outlet weir and spillway, composed of rock and concrete, is located where the ditch empties into Davis Creek (see HAER Photographs No. WA-16-14 and WA-16-15). Also in this vicinity, but located a short distance above the latter feature, there is a double reinforced concrete culvert, which held flashboards for regulating the water flow at the canal's lower end. A county road and the Pend Oreille Valley Railroad crosses over the ditch on this large culvert.

Despite setbacks, particularly long layoffs in 1935, the project finally neared completion in 1936. For some reason, however, the earthen ditch was never "puddled" to make the sidewalls watertight. "Puddling" involved dragging trees with branches over a mixture of clay and water, in order to pack down and seal the embankments. In those days, horse and mule teams usually were utilized to pull the trees. This oversight was to have disastrous results.

Reportedly, the time came when some local men decided to test the canal. As it turned out, it was a premature decision, since the ditch had not been sealed and was as yet unfinished. A group gathered at the diversion dam and dropped the flashboards, impounding the flow of Calispell Creek. On this first attempt, only a small amount of water should have been turned into the canal, but the men were inexperienced in these matters and sent a full head through the headgate spillway. The water rushed on along the first one-half mile of earthen ditch and into the

flume that crossed the Calispell Creek. The smaller, four-feet-wide flume was of considerably less area than the much larger, earthen ditch and, consequently the velocity of the flow increased dangerously in the wooden chute.

Water began churning turbulently after it left the east end of the flume and entered the next section of earthen ditch. Portions of the unsealed dirt embankment began giving way under the violent pressure and, ultimately water burst out of the ditch, rushed out into the open flats, and flowed back toward Calispell Creek and the lake. There was no alternative now but to shut the headgate. Another contributing factor to this failure may have been due to roaming cattle. Reportedly, livestock had been crossing the ditch for about a year, sloughing in large amounts of sand in the section where the canal burst.

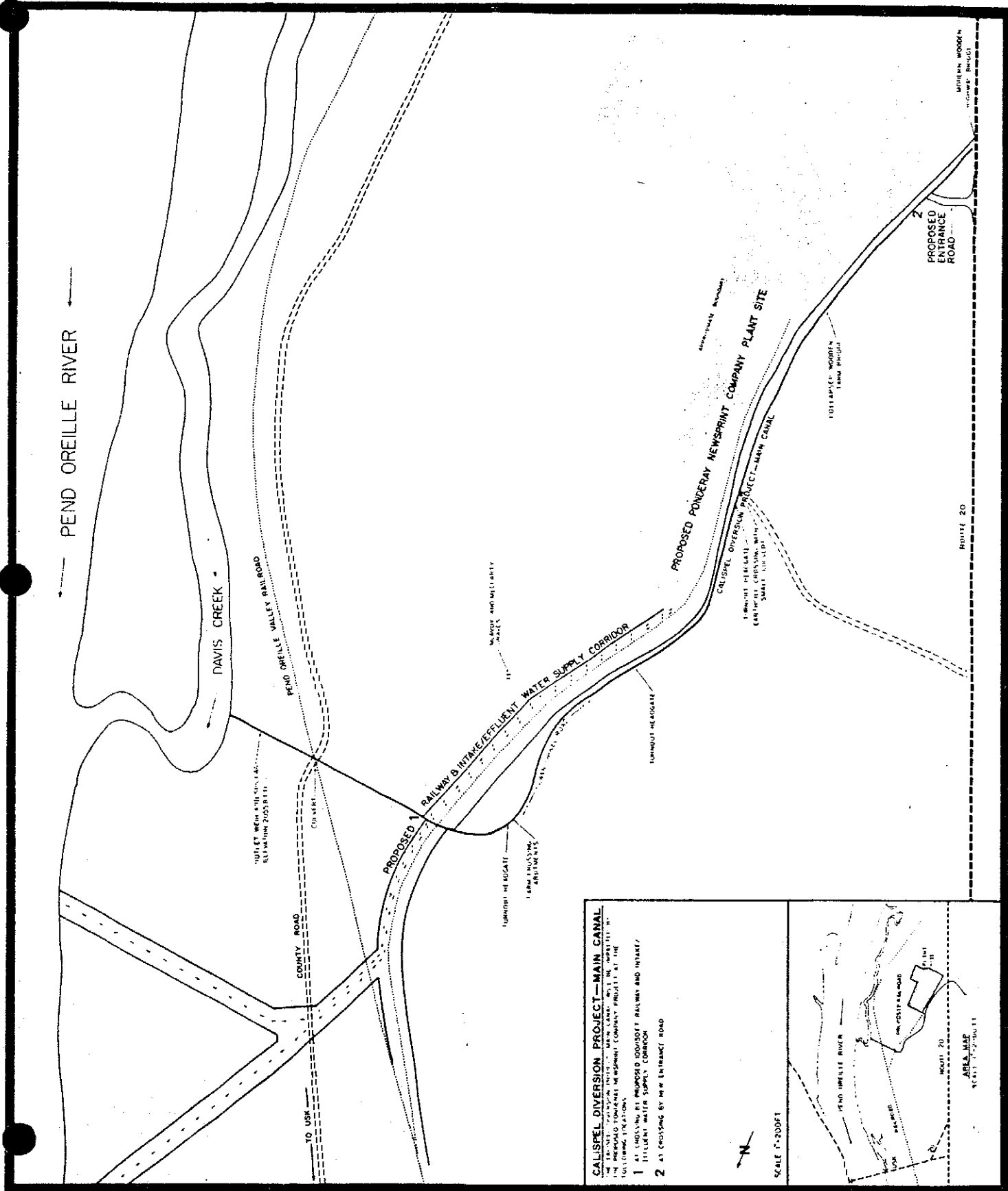
At any rate, the first and only attempt to operate the canal had ended in failure, and Calispell Creek continued to flow on in its own channel. It appears that no one was injured. The project still could have been made functional with some additional work and funding, but nothing more was done. Since that time, the canal has stood abandoned.

Today, the canal remains almost entirely intact. The only sections that have been significantly altered are the three wooden flumes, all of which have been razed, except for a prominent segment of the chute that crossed over Calispell Creek.

Still existing are all of the numerous rock and concrete structures, as well as the long sections of earthen ditches. Even many of the flashboards and other wooden parts still are in place in the headgate and on other masonry structures. As such, the canal remains today as an excellent example of early 20th century engineering technology.

Since the 1930s, trees and brush have group up in or along portions of the canal (see HAER Photographs No. WA-16-6 and WA-16-8), and some new roads have been built across it. Calispell Creek now flows freely through the diversion dam. As already mentioned, the wooden flumes have been dismantled, except for a section of the chute that crossed Calispell Creek. About 100 feet of the pilings and bracing of the latter feature yet stand immediately east of the stream. The wooden parts have deteriorated considerable in the moist climate of northeastern Washington, but it still is a particularly impressive structure. It was near the eastern end of this flume that the canal burst its bank the first and only time it was used.

If a proposed Ponderay Newsprint Company paper plant is constructed, it will impact on the canal in two places located approximately one-half mile and one mile from the canal's terminus at Davis Creek (see Map 2). These alterations would include a crossing by a new entrance road (see HAER Photograph No. WA-16-7), and a crossing by a new 100- or 150-foot railway and intake/effluent water supply corridor (see HAER Photographs No. WA-16-12 and WA-16-13). These two sites of



Map 2. The last (lowest) one mile of the ditch is adjacent to the project area.

potential impact are small in area, and are rather typical, nondescript segments of the earthen ditch. The property is owned by the Ponderay Newsprint Company (Lake Superior Forest Products Inc., agent for Ponderay Newsprint Company, P. O. Box 430, Thunder Bay, Ontario, Canada P7C 4W3).

STATEMENT OF SIGNIFICANCE

For at least 5,000 years, Indian people occupied villages in the Calispell Valley and dug vast quantities of camas, a staple root crop, in the moisture laden soil. White American stockmen and farmers first entered the valley in the mid-1880s and, with several decades, the entire locality was claimed and settled. During this period, the Kalispel Indians moved almost entirely to the east side of the Pend Oreille River, and a reservation was established in 1914. White settlers occupied the Calispell Valley on the west side of the river.

Annual flooding in late springtime and early summer was a recurrent problem, impeding agricultural development. In some years, a sheet of water many miles in width spread across the entire valley floor. Flood waters came from not only the Pend Oreille River, but also Calispell Creek and other small tributaries flowing down from the mountains on the west side of the valley. These inundations nourished an excellent late summer hay crop for livestock, but other kinds of agricultural activity suffered greatly or were downright unsuccessful. Only hay growing, dairying, and stock raising had proven really viable. The camas field on the Kalispel Indian Reservation still thrived under these conditions. The Indian people continued to gather roots there in the traditional way.

With country assistance, local farmers established a local diking and improvement district in an attempt to counter the massive runoff problem. Newly-constructed drainage ditches, gates, and dikes effectively thwarted outside waters (i.e., the Pend Oreille River), but the inside waters (i.e., Calispell Creek and the other small tributaries) still caused massive floods. Interestingly, the right of way of the Pend Oreille Valley Railroad, built in 1909, served as a dike on the east side of the valley. It was obvious that an even larger project was needed if the valley was to solve its flooding problems. Only then would farmers be able to expand or diversify the local agricultural economy.

By the early 1930s, all sections of the nation were suffering acutely from the onslaught of the Great Depression, and Pend Oreille County was no exception. The lumber industry was hard hit, money was scarce, farm prices fell to rock bottom, banks were failing, and all business activity was badly depressed. It was the Government's reaction to this severe crisis that finally created the means by which a large-scale reclamation enterprise could be attempted in the Calispell Valley.

In 1933, the Civil Works Administration (CWA) was established as one facet of the Roosevelt Administration's sweeping New Deal program. The purpose of the CWA was to fund the construction of roads, waterworks, airports, and other worthwhile

civic projects, and thus inject money and hope, the life blood of recovery, into local economies. Under this plan, any State, county, local, or municipal agency was eligible to initiate a project and receive funding for it, if approved, which normally was forthcoming. Officials in Pend Oreille County immediately took notice as the outlines of the program became known. The local employment situation was very bleak, and numerous out-of-work men desperately needed jobs and would be available for a large-scale public works project. The county took little time in deciding what to do.

The idea of a massive reclamation program in the Calispell Valley was nothing new, but support and money always had been lacking in earlier years and the scheme never got off the ground. However, the situation had obviously changed. It was probably in early 1933 that Thomas W. Fea of Usk recommended a revival of the reclamation plan to the irrigation committee of the Pend Oreille County Development League, a quasi-official group of citizens devoted to encouraging economic progress and improvement. The irrigation committee studied the practicality of the project for several weeks before presenting their findings at the next meeting of the Pend Oreille County Development League, which was held in Metaline Falls at the Washington Hotel on Monday, April 24, 1933. It proved to be the largest gathering ever of league members up to that time.

More than 130 citizens looked on expectantly as Harold A. Sewell, chairman of the irrigation committee, announced that the project was feasible and could be built at an estimated cost of between \$50,000 and \$100,000. Central to the plan was the construction of a seven-mile-long canal, into which the flood waters of Calispell Creek would be diverted and conveyed to the Pend Oreille River. This would prevent much of the annual flooding of those portions of the valley that were inside the existing and planned diking and drainage system. It was anticipated that between 1,800 and 2,500 acres of annually flooded land could be reclaimed, and the scheme also would allow for the irrigating of probably a comparable amount of other land that had always been too dry to farm. The league quickly and unanimously passed a resolution supporting the project.

Events moved fast during the New Deal era, and it took just seven months for county officials to get final approval and funding from the appropriate State and Federal agencies. In late November 1933, it was announced that the CWA" was allotting up to \$60,000 for the project. The local farmers in diking district no. 2 also would pay modest contributions to the construction fund. Free irrigation would be provided as compensation to those farmers whose property would be crossed by the proposed canal.

Out-of-work men throughout the county were urged to register at the recently-established employment offices in Newport, Ione, Metaline Falls, Cusick, and Usk. Persons on the relief rolls likewise were actively recruited for the project. The CWA and other Government agencies had granted other funds for local road, water, sewer, and airport projects, but the Calispell canal would be the

largest and most ambitious single public works program yet attempted in Pend Oreille County. In fact, it has been eclipsed in more recent years only by the major dam building projects on the Pend Oreille River.

Harold A. Sewell, chairman of the League's irrigation committee and president of the Interstate Engineering and Construction Company of Newport, began surveying the canal route in mid-1933. By the end of the year, Sewell and other assistants prepared the finalized design, known as the "Calispell Diversion Project-Main Canal." Work began immediately. The original intention was to complete the ditch in about six months, or by May 1, 1934, but, in actuality, construction activity would continue intermittently for the next several years and additional funds would be required. The total cost in the end appears to have been around \$100,000, which was at about the maximum amount originally anticipated by the League's irrigation committee.

Sewell served as the project's first consulting engineer, but only for a short time. He already had much experience building flumes and canals for logging operations, domestic water systems, and various municipal works in Pend Oreille, the Spokane area, and other outlying localities. Though he had designed the reclamation scheme, Sewell left the project by February 1934, and Chleon Carter took over as supervising engineer.

According to Government regulations, a maximum proportion of the allocated funds was to be paid out in wages. Consequently, the work was intentionally labor-intensive; the numerous hand-built rock and concrete features in the project area are clear evidence of this policy. Wages for unskilled laborers averaged about 50 cents an hour, while semi-skilled and skilled men got more. The size of the workforce varied with fluctuations in money and materials, but an average of between 50 and 150 men were usually on the job. In the spring of 1934, workers were hired for 15 hours a week, and they operated in three shifts. Each individual's financial condition and number of dependents were carefully noted, so that those most needing a job were sure to get one. Payrolls were distributed weekly in cash.

By the fall of 1934, the canal was about two-thirds finished, at a cost of \$70,000. It was estimated at the time that another \$26,000 would be needed for completion, but the project once again was plagued by delays, and progress slowed in 1935.

Finally, in early 1936, more than three years after construction had first started, additional funds were allocated and the project was reactivated for the last time. Chleon Carter still was in charge, but other administrative changes had occurred. Whereas the project had first begun under the CWA, it later switched to Federal flood control and the Public Works Administration (PWA), and then finally to the Works Progress Administration (WPA).

It was under the auspices of the wpa that the project neared completion. The canal probably would have been finished, had it not been for a premature testing, which ended when water burst through the canal walls after the opening of the main floodgate.

The canal still could have been salvaged with more work and funding, but none was forthcoming. Local people certainly appreciated the jobs and money that the project had brought to Pend Oreille County, but, for the most part, they had lost interest in the reclamation scheme. The local economy finally was improving, and most of the workers had returned to the sawmills, mines, and logging operations.

Agricultural markets too were reviving, and excellent wild hay and timothy continued to be grown in the valley. It had long been known that other crops, such as alfalfa, wheat, potatoes, etc., fared poorly here, due not only to the yearly inundations, but also because of the short growing seasons and long winters in northeastern Washington. In all likelihood, the reclamation and irrigation scheme would have had only a minimal impact in alleviating these seasonal limitations, which so greatly restricted agricultural development in the Calispell Valley.

A regional sportsmen's organization, known as the "Calispell Duck Club," also may have been more or less opposed to the project, because it would have drained much of the final waterfowl habitat in the Calispell Valley. Their opposition, if present, might have been another factor in the decision not to salvage the canal.

If the project had been completed, it would probably have allowed more grain to be planted, and certainly would have increased hay production. In this regard, the project would have made a significant contribution to the area's agricultural economy. Furthermore, it would have eliminated inconveniences caused by annual inundations. The scheme still remains technically feasible today. In more recent years, an efficient pumping plant has been installed at the mouth of Calispell Creek, which effectively regulates the flow of the creek and prevents massive flooding.

NATIONAL REGISTER EVALUATION

The Calispell Diversion Canal appears eligible for inclusion in the National Register of Historic Places at the regional and local levels under criteria 1 and 3. The feature dates from the early 1930s and thus meets the 50 year eligibility requirement. It has experienced very few modern intrusions, which mainly include only sporadic crossings by newer State, county, and private roads. The property retains all seven elements of integrity (location, design, setting, materials, workmanship, feeling, and association).

Construction of the canal was one of the largest and most widely-publicized Government projects undertaken in northeast Washington during the New Deal years of the 1930s. It was the most ambitious reclamation and irrigation scheme ever

attempted in the Calispell Valley, where perennial flooding had hindered agricultural development since the early days of White settlement. Though the project was never completed, it provided desperately-needed wages to many needy people and thus helped relieve the shortages and suffering being experienced by numerous families. Furthermore, it symbolized the determination of Federal, State, and county agencies to revive and regenerate the local economy, which had been devastated by the Great Depression.

The Civil Conservation Corps (CCC), which was not involved in the Calispell project, has received considerable nationwide attention from scholars and the media in recent years, somewhat at the neglect of other New Deal organizations that played equally significant roles. On the other hand, the Civil Works Administration (CWA), the Public Works Administration (PWA), and the Work Progress Administration (WPA), all of which did sponsor the canal project, were just as important and noteworthy during this unique era, and they too merit special attention. The Calispell canal is a significant and well-preserved example of the kind of public works projects that the latter organizations created and supported. Thus, the canal has been "associated with events that have made a significant contribution to the broad patterns of our history" and qualifies under criteria 1.

The feature also meets criteria 3 because it exhibits "the distinctive characteristics of the type, period, and method of construction" inherent in a large-scale reclamation and irrigation project of the early 20th century. Most of the construction work was done by hand labor and with horse and mule teams, and the facility was designed to be entirely manually operated. The project was abandoned when nearing completion in the mid-1930s, and has remained virtually intact and unaltered ever since. Today, it is essentially a museum piece. Its features clearly delineate the intended functions of the various parts of the reclamation and irrigation scheme and, as such, reveal much about the engineering methods and technology utilized in the 1930s and preceding decades. Few, if any, unmodified canals of similar age and size are located elsewhere in the Pacific Northwest.

MAJOR BIBLIOGRAPHICAL REFERENCES

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December 28, 1933; January 18, January 25, february 1, February 22, March 8,
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Claude Jared, Box 328, Newport, Washington 99156; interview November 19, 1985.

Lester Jared, 731 N. 88th, Seattle, Washington 98103; interview November 19, 1985.

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Don Zigler, Rt. 1, Box 975, Newport, Washington 99156; interview November 12,
1985.

NOTE: Please see HAER Field Records for additional project data (photographs,
U.S.G.S. maps, and drawings)